# The audio data writing procedure.

ML610Q346

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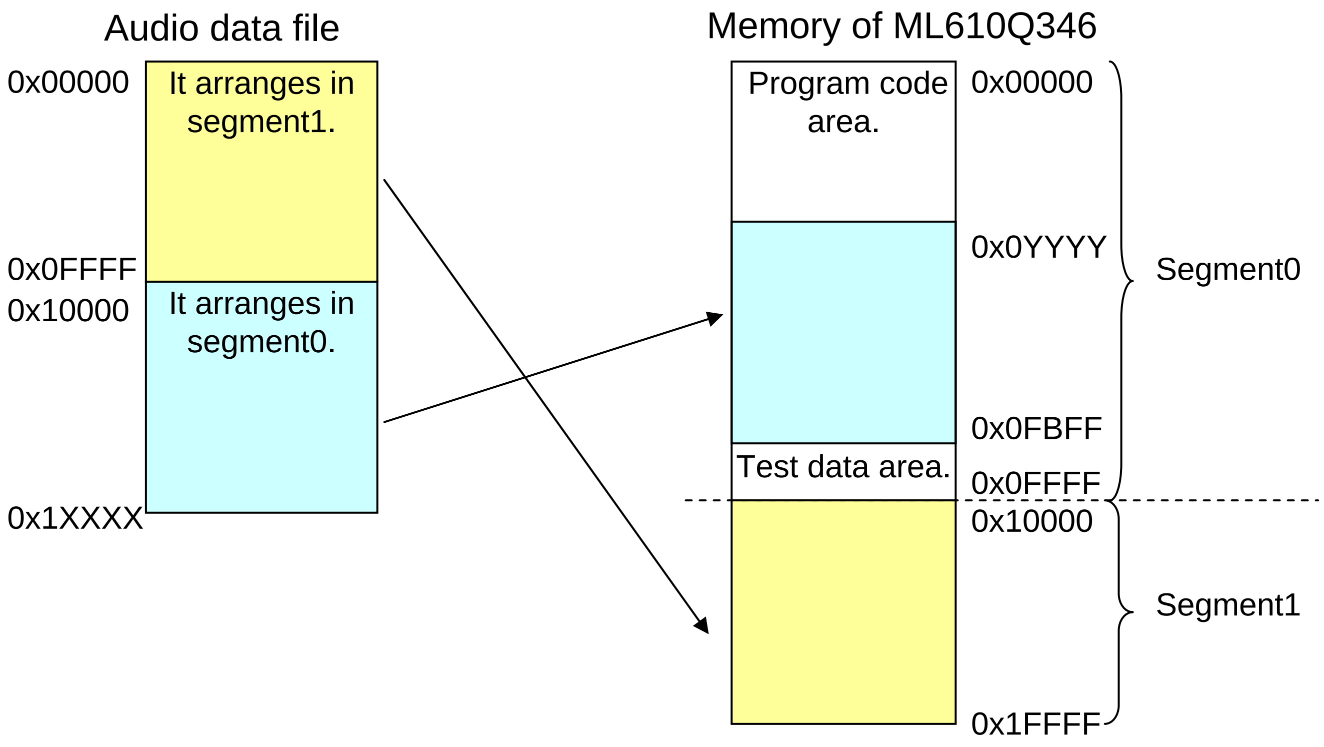
## Index

# The arrangement of the ML610Q346 audio data.

| Address of audio data file. | Memory address of ML610Q346 |
|---|---|
| 0x00000 - 0x0FFFF | 0x10000 - 0x1FFFF(1) |
| 0x10000 - 0x1XXXX | The free space of segment0 0x0YYYY - 0x0FBFF |

*The start address of segment0 is setting by initialize function of speech library.



## Overview

- The procedure which writes the audio data which was created in Speech LSI Utility to MCU
  - By the following order, the audio data writing procedure is explained. ( This explanation is based on ML610Q346. )

1. Audio data making and save.

   The audio data make by Speech LSI Utility and save at Motorola S format.

2. Writes an audio data to MCU.

   When the first time writing, it writes by FWuEASE Flash Writer.

3. Audio data save by DTU8.

   By saving in DTU8(debugger) , next time writes can be simplified.

4. Audio data write by DTU8.

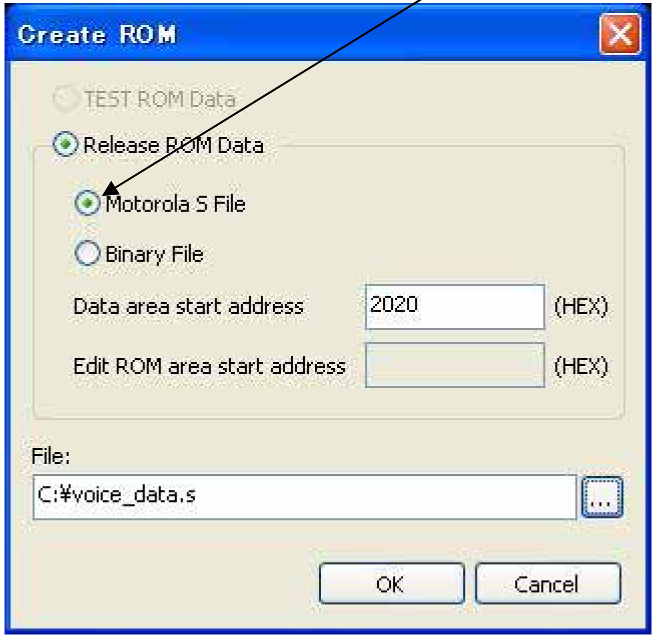
   By using the data saved by the way of topic "3.", it can write in by operation of only DTU8 the 2nd time and afterwards.

## 1. Audio data making and save.

- The audio data make by Speech LSI Utility and it saves a audio data by the setting of the figure which is shown in the following.

The save-format : Save at Motorola S File format

Confirm that it is selecting this part.



Create ROM

TEST ROM Data

[✓ Release ROM Data]

[✓ Motorola S File]

Binary File

Data area start address: 2020 (HEX)

Edit ROM area start address: (HEX)

File: C:¥voice_data.s

# 2. Writes an audio data to MCU. (1/2)

- The audio data writes to MCU by FWuEASE Flash Writer.
  ( The audio data to write uses the file which saved by the preceding chapter. )

<Setting for write to segment1>
After the entry completion which is shown in the following figure, it adds to the File List by the [Add to List] button click.
With this, the setting in segment1 is completion.

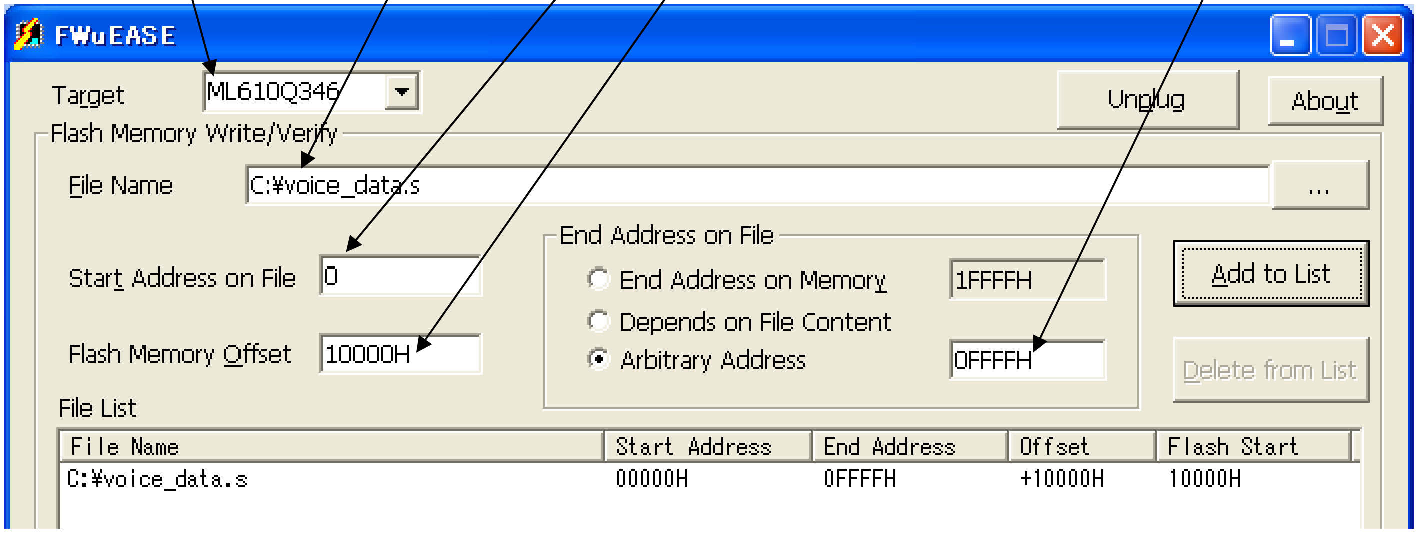
**Set the file which was created by Speech LSI Utility.**

The beginning of the file is 0H.

**End of address of file which write to segment1.**

**Set a target LSI.**

The beginning of the flash memory is 0H.



Target: ML610Q346

Flash Memory Write/Verify

File Name: C:¥voice_data.s

Start Address on File: 0

Flash Memory Offset: 10000H

End Address on File
- End Address on Memory: 1FFFFH
- Depends on File Content
- [✓ Arbitrary Address]: 0FFFFH

File List

| File Name | Start Address | End Address | Offset | Flash Start |
|---|---|---|---|---|
| C:¥voice_data.s | 00000H | 0FFFFH | +10000H | 10000H |

## 2. Writes an audio data to MCU. (2/2)

<Setting for write to segment0>

After the entry completion which is shown in the following figure, it adds to the File List by the [Add to List] button click.

With this, the setting in segment0 is completion.

* When there is not audio data to write in segment0, you need not write audio data to segment0.

- The offset of the flash memory becomes -000CH with the following formula.

  4000H – 10000H = -C000H

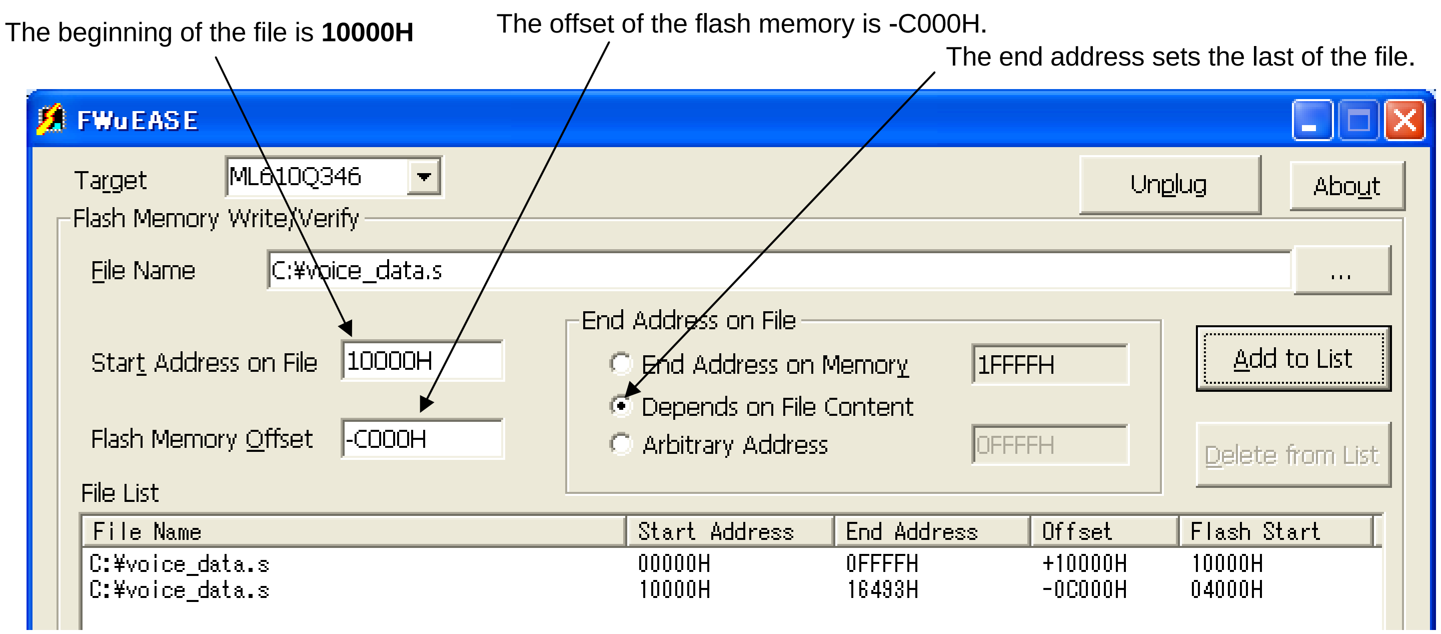
  4000H: The audio data entry address in segment 0 (On the supposition that there is program into 0-3FFFH.)

  10000H: The address immediately behind the audio data which was arranged in segment1

  -C000H: Offset of flash memory address.

The setting to write audio data to MCU is completion.

It writes to flash memory by the [Write&Check] button click.


The beginning of the file is **10000H**
The offset of the flash memory is -C000H.
The end address sets the last of the file.
FWuEASE
Unplug
About
...
Add to List
Delete from List

Target: ML610Q346

Flash Memory Write/Verify

File Name: C:¥voice_data.s

Start Address on File: 10000H

Flash Memory Offset: -C000H

End Address on File
- End Address on Memory: 1FFFFH
- [✓ Depends on File Content]
- Arbitrary Address: 0FFFFH

File List

| File Name | Start Address | End Address | Offset | Flash Start |
|---|---|---|---|---|
| C:¥voice_data.s | 00000H | 0FFFFH | +10000H | 10000H |
| C:¥voice_data.s | 10000H | 16493H | -0C000H | 04000H |

## 3. The audio data save by the DTU8 (Debugger).

- The audio data written in MCU by the explain of the preceding chapter, save so that it can be used by DTU8.
  By doing this, the audio data can write by DTU8 from the next time.

■ Save the audio data of segment1

1. It starts up DTU8 and it chooses " Save program to file " of " File menu ".
2. It enters "Start address" (10000H) and "End address" (1FFFFH) and a "File name" for segment1.

("Motorola S2 format" or "Intel HEX format" of the type of files is not a problem in the file type. It is optional.)

3. When clicking the “Save” button after the above entry, it is saved by the specified file format.

■ Save the audio data of segment0

4. Following the above item 3., it enters "Start address" (4000H) and "End address" (FBFFH) and a "File name" for segment0.

("Motorola S2 format" or "Intel HEX format" of the type of files is not a problem in the file type. It is optional.)

5. When clicking the “Save” button after the above entry, it is saved by the specified file format.

* When there is not audio data to write in segment0, you need not save audio data to segment0.
* When on the supposition that there is program into 0-3FFFH, it makes the above start address 4000H

# 4. The audio data write by the DTU8 (Debugger).

- The procedure which writes the audio data which saved by the preceding chapter in MCU using DTU8 is described.

■ Load the audio data of segment1

1. It starts up DTU8 and it chooses " Load program to file " of " File menu ".
2. It chooses the file which saved for segment1 and it enters "Start address" (10000H) and "End address"(1FFFFH).
3. When clicking the “Open” button after the above entry, it is written an audio data for segment1 of MUC.

■ Load the audio data of segment0

4. Following the above item 3., it chooses the file which saved for segment0 and it enters “Start address” (4000H) and “End address“ (FBFFH).
5. When clicking the “Open” button after the above entry, it is written an audio data for segment1 of MUC.

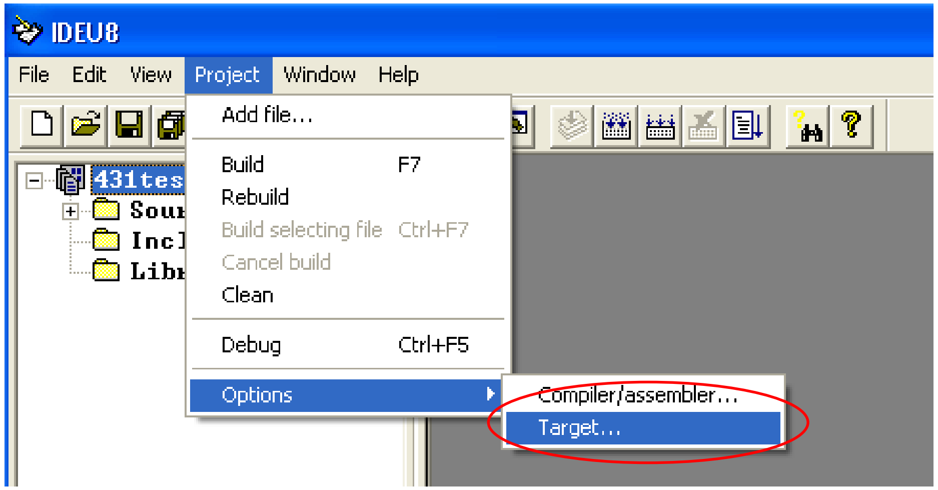
* When there is not audio data to write in segment0, you need not write audio data to segment0.
* When on the supposition that there is program into 0-3FFFH, it makes the above start address 4000H
* When writing an audio data in the condition which a program is already written in, set "Value of blank area" to "Contents of the Flash Memory" at entry of item 4. .
* In the same way. When writing a program after the audio data writing in DTU8, it sets "Value of blank area" to "Contents of the Flash Memory" at entry of item 4. .

# 5. Generate "the ROM image data" by the HTU8.

• The way of making program data and an audio data one HEX format file by HTU8 is Specified in this chapter. Moreover, are specified about the way of writing in to ML610Q346. The data which is explained in this chapter uses the data which was defined in the "The arrangement of the ML610Q346 audio data. (page 3)" chapter.

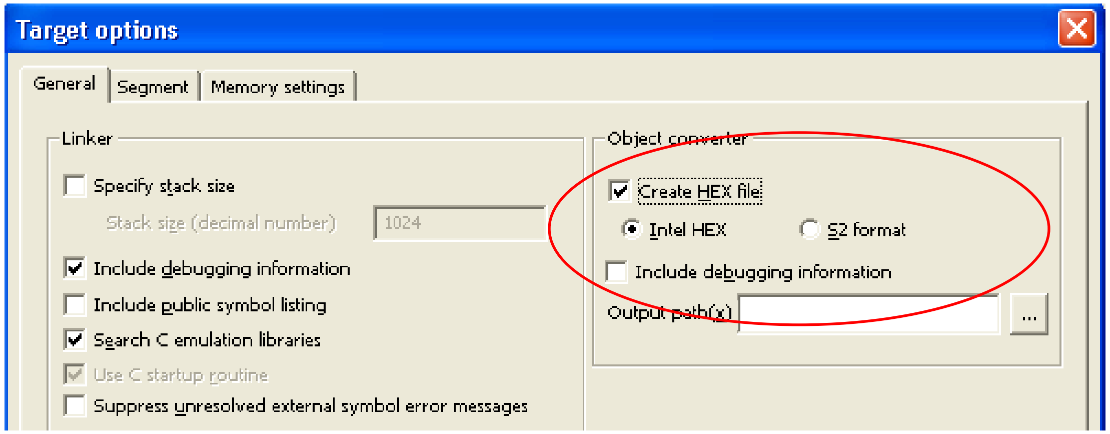
## 5-1. Convert ABS file to the HEX (1/2)

■ You have to convert an object file that is included the debugging information to the HEX data that are input files of HTU8. (Here-in-after, the object file is called the ABS file.)
It shows the way to convert the ABS file to “the HEX data” as following. We recommend setting up the following settings at the time of the beginning of program development stage.
As shown in the figure, select [Project] [Options] [Target] from the IDEU8 menu.



## 5-1. Convert ABS file to the HEX (2/2)

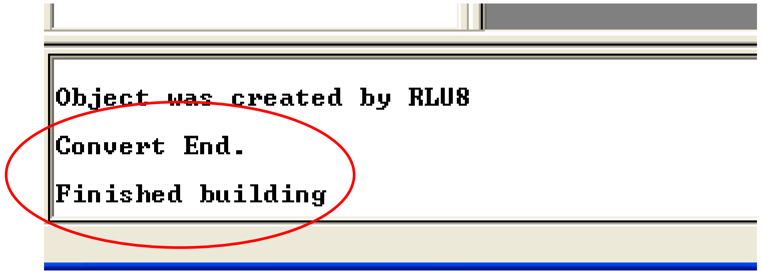
- As shown in the figure, select [General] tab from [Target options] dialogue. Check on [Create HEX file] in the [Object converter] group, select [Intel HEX] and check off [Include debugging information].



Linker:
- [ ] Specify stack size
- Stack size (decimal number) 1024
- [✓] Include debugging information
- [ ] Include public symbol listing
- [✓] Search C emulation libraries
- [✓] Use C startup routine
- [ ] Suppress unresolved external symbol errors messages

Object converter:
- [✓] Create HEX file
- [✓ Intel HEX] S2 format
- [ ] Include debugging information
- Output path(x)

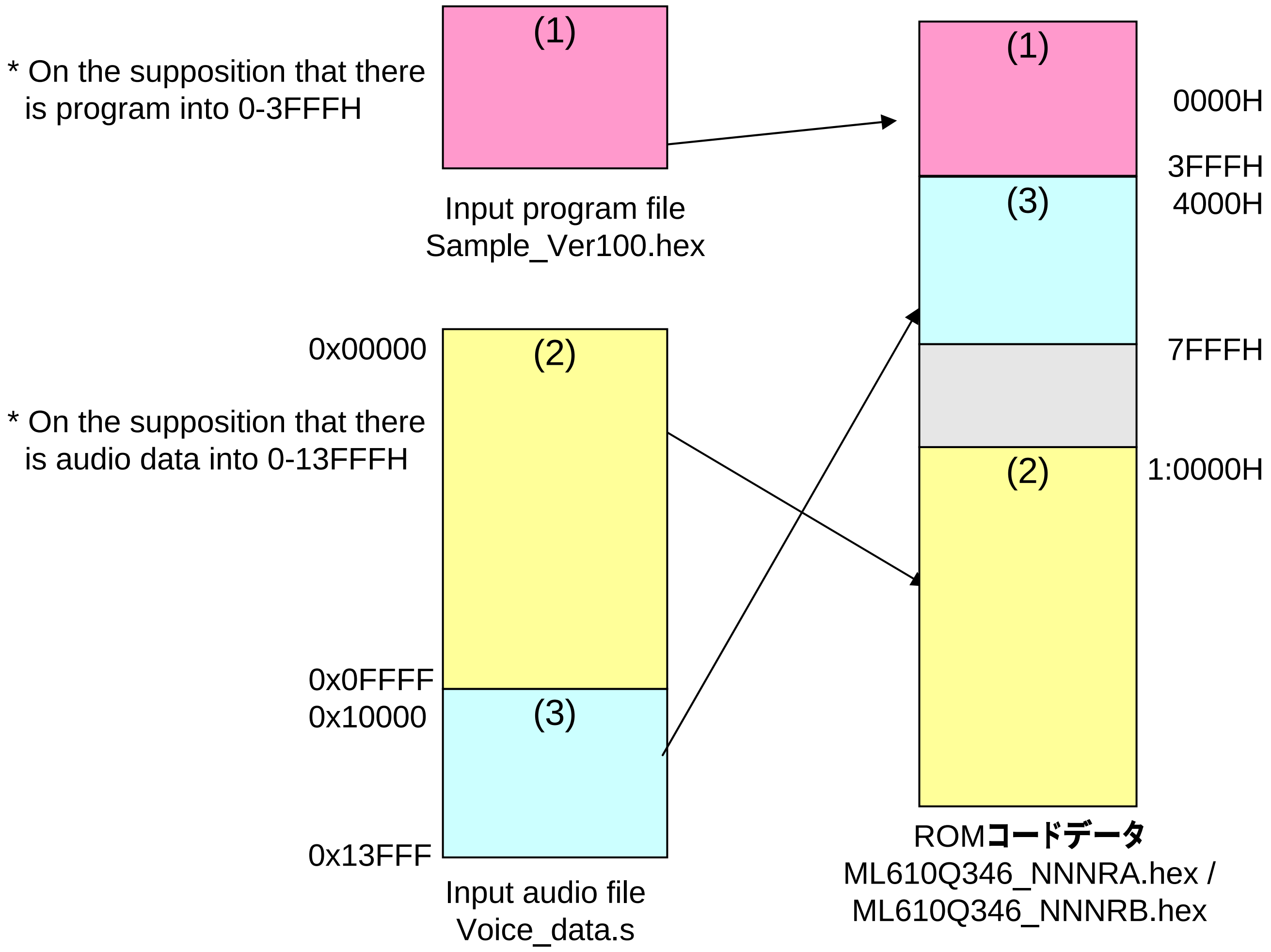
- Build your program. After the building process is finished, confirm two messages "Convert End.", "Finished building" are displayed in the output window as shown in the figure. "The HEX data" will be output in the specified folder.



```
Object was created by RLU8
Convert End.
Finished building
```

## 5-2. Generate “the ROM code data” from “the HEX data and the audio data" by HTU8. (1/2)

■ The following figure shows the relationship of input files and ROM code data file.



NOTE) Input audio file (Voice_data.s): The file which was created at “Audio data making and save.” of chapter 1
Input program file (Sample_Ver100.hex): The file which was created at “Convert ABS file to the HEX.” of chapter 5-1.

## 5-2. Generate “the ROM code data” from “the HEX data and the audio data" by HTU8. (2/2)

- From the Start menu, select “All programs” >”U8 Tools”>”nX-U8”>”Command-line environment” icon to open the U8 command prompt.
- On the U8 command prompt, by using CD command, move to the folder which “the complete HEX data” is located in.
  For example, if “the HEX data” is located in “C:/Test/Sample/Hex”, input the command as follows.
  Example: CD C:/Test/Sample/Hex
- On the U8 command prompt, execute HTU8, please. Specified the example which used a response file in this document. The response file is a text file which specified the input files and the options. It is convenient when you specify multiple input files or specify complex operation by options. The following example shows the sample of response file. It creates this example from the input-file image of the pre-page.

```
// Sample of the response file (Sample.res)
Sample_Ver100.hex                              // Input file 1 (program file)
voice_data.s /AL(0, 0FFFFH, 1:0000H)           // Input file 2 (audio file)
voice_data.s /AL(1:0000H, 1:3FFFH, 0:4000H)    // Input file 3 (audio file)
/TM610346                                      // Target
/FML610Q346_NNN                                // Output file name
/OH                                            // Output file format
```

- On the U8 command prompt, execute response file.
  Type “HTU8 @Sample.res” and execute.
  In the above example case, HTU8 generates two (2) “the ROM code data” files (ML610Q346_NNNRA.hex, ML610Q346_NNNRB.hex) and a log file (ML610Q346_020RA.log).

## 5-3. The writing in of the ROM code data

■ Writes the ROM code data (ML610Q346_NNNRA.hex) which was created by the preceding clause in Flash ROM.
When writing created ROM code data to Flash ROM using FwuEASE, two pieces of data must be divided. Because, when writing in Flash ROM, it is to avoid an unused-area and to have to be written.
It is possible to write notes easily to ignore an unused-area if using MwuEASE. It recommends to be used in MwuEASE.

Please refer to "Multiple Flash Writer MWuEASE User's Manual" for how to use MwuEASE.

*Request MwuEASE software to attach it in case of on-chip debugger uEASE purchase.